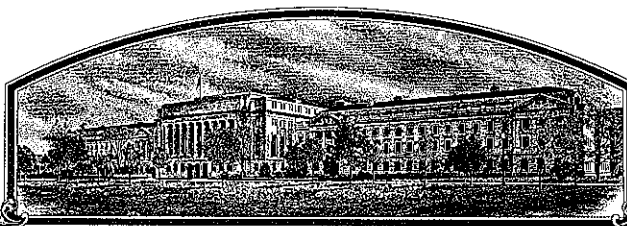


No.

9200049



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Pennsylvania Agricultural Experiment Station

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT.

UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF THE RIGHTS. (34 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

BARLEY

'Pennbar 66'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this 30th day of June in the year of our Lord one thousand nine hundred and ninety-four.

Attest:

Kenneth A. Evans
Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Mike Egan
Secretary of Agriculture



U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) (as it is to appear on the Certificate) Pennsylvania Agricultural Experiment Station Pennsylvania State University		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NO. PA8444-66	3. VARIETY NAME Pennbar 66
4. ADDRESS (street and no. or R.F.D. no., city, state, and ZIP) Rm. 229 Agricultural Administration Bldg. University Park, PA 16802		5. PHONE (Include area code) 814-865-5410	FOR OFFICIAL USE ONLY PVPO NUMBER <div style="font-size: 2em;">9200049</div> F I L I N G Date <div style="font-size: 1.2em;">December 20, 1991</div> Time <input type="checkbox"/> A.M. <input type="checkbox"/> P.M. F E E S Filing and Examination Fee: <div style="font-size: 1.2em;">\$ 2150.⁰⁰</div> Date <div style="font-size: 1.2em;">December 20, 1991</div> R E C E I V E D Certificate Fee: <div style="font-size: 1.2em;">\$ 250.⁰⁰</div> Date <div style="font-size: 1.2em;">June 16, 1994</div>
6. GENUS AND SPECIES NAME Hordeum vulgare	7. FAMILY NAME (Botanical) Gramineae		
8. CROP KIND NAME (Common Name) Barley, winter	9. DATE OF DETERMINATION December 3, 1990		
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.) Land Grant University			
11. IF INCORPORATED, GIVE STATE OF INCORPORATION		12. DATE OF INCORPORATION	
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS C. R. Krueger, Assoc. Dean Research Rm. 229 Agricultural Administration Bldg. University Park, PA 16802			

PHONE (Include area code): 814-865-5410

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow INSTRUCTIONS on reverse)

a. ☒ Exhibit A, Origin and Breeding History of the Variety.

b. ☒ Exhibit B, Novelty Statement.

c. ☒ Exhibit C, Objective Description of Variety.

d. ☐ Exhibit D, Additional Description of Variety.

e. ☒ Exhibit E, Statement of the Basis of Applicant's Ownership.

f. ☒ Seed Sample (2,500 viable untreated seeds). Date Seed Sample mailed to Plant Variety Protection Office _____

g. ☒ Filing and Examination Fee (\$2,150) made payable to "Treasurer of the United States."

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See section 83(a) of the Plant Variety Protection Act.)
☒ YES (If "YES," answer items 16 and 17 below) ☐ NO (If "NO," skip to item 18 below)

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
☒ YES ☐ NO

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
☒ FOUNDATION ☐ REGISTERED ☒ CERTIFIED

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?
☐ YES (If "YES," through ☐ Plant Variety Protection Act ☐ Patent Act. Give date: _____)
☒ NO

19. HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETING IN THE U.S. OR OTHER COUNTRIES?
☐ YES (If "YES," give names of countries and dates)
☒ NO

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in section 41, and is entitled to protection under the provisions of section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.


SIGNATURE OF APPLICANT (Owner(s)) 	CAPACITY OR TITLE Associate Dean for Research	DATE 12/16/91
SIGNATURE OF APPLICANT (Owner(s))	CAPACITY OR TITLE	DATE

EXHIBIT-A, Origin and Breeding History of Pennbar 66 Winter Barley

Pedigree: Harrison/3/Cebada Capa/Wong//Awnleted Hudson Selection/4/Hanover
/Jefferson//Barsoy

The bulk breeding method was used to develop Pennbar 66 winter barley and the initial selection was made in the F₇ generation. Pennbar 66 was derived from row 8336-1201 in the 1983 Headrow Nursery at The Pennsylvania State University. Pennbar 66 was bred and selected for high grain yield, high test weight, winter survival, standability, and field resistance to diseases.

- 1981-83 Some reselection was practiced in row nurseries.
- 1984 Grown in plot 8444-66 of the Seed Increase Nursery.
- 1985 Seed from PA8444-66 was increased for use in trials in subsequent years. A low frequency of awnleted variants was observed.
- 1985-90 Evaluated in replicated yield trials in Centre County, Pennsylvania.
- 1987-90 Evaluated in replicated yield trials in Lancaster County, Pennsylvania.
- 1986 Freezing hardiness evaluated in laboratory tests.
- 1989-90 Evaluated in the Uniform Barley Winter Hardiness Nursery and the Uniform Barley Yield Nursery.
- 1990 Evaluated in agronomic trials in Maryland.
- 1988 Seed of PA8444-66 (Pennbar 66) tracing to 1984 seed increase was grown in isolation for seed increase. A low frequency of awnleted variants as well as variants with longer awns were observed. Head selections were made for evaluation in headrows in 1989. Two bushels of breeder seed were harvested after head selection.
- 1989 Headrows were grown in isolation and evaluated for plant type. Rows having plants with an atypical awn type or slightly taller variants were eliminated.
- 1990 Selected headrows were evaluated in plots that were three feet wide and 12 feet long. A low frequency of awnleted variants as well as variants with longer awns were observed. The variants were removed and one hundred typical heads were selected from each of the 102 selected plots for the next generation of breeder seed in 1991. Five bushels of breeder seed were produced.
- 1991 Hand harvested heads from each of the 102 selected plots in 1990 were threshed and seeds were grown in 102 plots that were three feet wide and 24 feet long. A low frequency of awnleted variants (less than one half of one percent) was still observed and nineteen bushels of breeder seed were produced. As in 1990, 100 typical awned heads were hand selected from each of the 102 plots to produce breeder seed in 1992.

9200049

1992

Hand harvested heads from each of the 102 plots were threshed and seeds were grown in 102 plots that were three feet wide and 24 feet long. A low frequency of awnleted variants (less than one half of one percent) were observed and 17 bushels of breeder seed were produced. Again 100 typical awned heads were hand selected from each of the 102 plots for the production of breeder seed in 1993.

In breeder seed production of 1984, 1985, 1990, 1991, and 1992, a low frequency of variants of less than one half of one percent appeared. Seed of Pennbar 66 can be maintained and reproduced within commercially acceptable limits.

EXHIBIT-B, Novelty Statement.

Pennbar 66 is a six-row, hulled, winter feed barley with fully awned spikes. It most nearly resembles Barsoy and Ray, two other winter barley varieties with fully awned spikes. Differences include, but are not necessarily restricted to the following:

Pennbar 66 compared to Barsoy:

1. Pennbar 66 heads about 6-7 days later (Table 1).
2. Pennbar 66 has a straight neck.
3. Pennbar 66 is about 5 cm (2 inches) taller (Table 1 and 2).
4. Pennbar 66 is more resistant to leaf rust (Table 3).
5. Grain yield of Pennbar 66 is about 50 percent higher in Centre County, and 14 percent higher in Lancaster County, Pennsylvania (Tables 1 and 2).
6. Pennbar 66 has better lodging resistance (Table 4).
7. Pennbar 66 has better freezing resistance (Table 5).

Pennbar 66 compared to Ray:

1. Pennbar 66 heads about 2-3 days earlier (Table 1).
2. Pennbar 66 is about 13 cm (5 inches) shorter (Tables 1 and 2).
3. Pennbar 66 is more resistant to net blotch (Table 3).
4. Grain yield is about 11 percent higher in Centre County and 14 percent higher in Lancaster County, Pennsylvania (Tables 1 and 2).

EXHIBIT-B

Table 1. Performance of Pennbar 66 in Centre County, Pennsylvania during 1986-1990.

GRAIN YIELD (bu/A)							
Entry	Year					Average	
	1990	1989	1988	1987	1986	2 yr.	5 yr.
Pennbar 66	130	101	182	112	113	116	128
Pennco	139	96	159	126	114	118	127
Barsoy	82	71	127	48	77	77	81
Ray	127	80	--	--	--	104	--
LSD (.05)	9	8	17	11	10		
BUSHEL WEIGHT (lb/bu)							
Pennbar 66	50.3	47.0	53.3	49.6	48.1	48.9	49.7
Pennco	48.1	43.7	51.1	47.8	45.2	45.9	47.2
Barsoy	50.5	46.9	53.8	48.8	49.6	48.7	49.9
Ray	49.6	47.6	--	--	--	48.6	--
LSD (.05)	0.7	0.9	0.7	0.9	1.1		
PLANT HEIGHT (in)							
Pennbar 66	37	36	41	35	32	37	36
Pennco	37	37	38	37	32	37	36
Barsoy	29	33	38	29	29	31	32
Ray	41	42	--	--	--	42	--
LSD (.05)	2	2	2	3	2		
HEADING DATE (date in May)							
Pennbar 66	14	22				18	
Pennco	12	19				16	
Barsoy	8	13				11	
Ray	17	23				20	

EXHIBIT-B

Table 2. Performance of Pennbar 66 in Lancaster County, Pennsylvania during 1987-1990.

GRAIN YIELD (bu/A)						
Entry	Year				Average	
	1990	1989	1988	1987	2 yr.	4 yr.
Pennbar 66	108	99	116	106	104	107
Pennco	92	84	127	105	88	102
Barsoy	84	94	91	100	89	92
Ray	101	76	--	--	89	--
LSD (.05)	13	26	14	21		
BUSHEL WEIGHT (lb/bu)						
Pennbar 66	51.1	46.8	52.9	48.4	49.0	49.8
Pennco	48.2	42.2	49.6	45.7	45.2	46.4
Barsoy	52.6	47.2	52.8	49.3	50.0	50.0
Ray	51.1	48.4	--	--	50.5	--
LSD (.05)	0.5	1.9	0.9	1.6		
PLANT HEIGHT (in)						
Pennbar 66	36	39	36	41	38	38
Pennco	34	40	38	40	37	38
Barsoy	34	39	36	42	37	38
Ray	41	45	--	--	43	--
LSD (.05)	2	2	1	2		

EXHIBIT-B

Table 3. Leaf disease reaction of Pennbar 66 and barley cultivars observed in the field in Center and Lancaster Counties.

CENTRE COUNTY								
Entry	Leaf rust			Net blotch			Scald	Powdery Mildew
	1990	1987	1986	1989	1987	1986	1987	1986
	-----%			(0-5)†	%	%	%	%
Pennbar 66	0	1	1	1.0	1	0	1	0.3
Pennco	0	3	7	2.0	8	12	0	0.1
Barsoy	50	21	47	4.0	5	1	13	0.0
Ray	0	--	--	3.0	-	-	-	--
LSD (.05)	-	10	8	0.7	7	6	6	0.6

†Rating scale: 0 = none, 5 = severe.

LANCASTER COUNTY

Entry	1987		
	Net blotch	Leaf rust	Powdery Mildew
	-----%		
Pennbar 66	1	3	9
Pennco	10	5	0
Barsoy	4	48	18
LSD (.05)	8	10	7

Note: Except as indicated, data are percentages of leaf area affected.

EXHIBIT-B

Table 4. Percentage lodging of Pennbar 66 and barley cultivars in two locations in Pennsylvania where good differential lodging occurred.

	County	
	Centre <u>1989</u>	Lancaster <u>1987</u>
	-----%	
Pennbar 66	0	0
Pennco	3	21
Barsoy	69	38
Ray	10	--
LSD (.05)	7	26

EXHIBIT-B

Table 5. Freezing hardiness of winter barley varieties and selections (86FZ16).

Cultivar or selection	Freezing+ score
Maury	5.4
Pennbar 66	4.3
Pennco	4.2
Barsoy	1.8
LSD (.05)	1.0
C.V. (%)	13.6

+Scale 0 through 6 based on recover growth; 0 = no regrowth, 6 = vigorous regrowth.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK AND SEED DIVISION
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(Barley)

OBJECTIVE DESCRIPTION OF VARIETY
BARLEY (*HORDEUM VULGARE*)

INSTRUCTIONS: See Reverse.

NAME OF APPLICANT (S) Pennsylvania Agricultural Experiment Station, Pennsylvania State University		FOR OFFICIAL USE ONLY	
ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code) Rm. 229 Agricultural Administration Building University Park, PA 16802		PVPO NUMBER 9200049	
		VARIETY NAME OR TEMPORARY DESIGNATION Pennbar 66	

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (i.e. or) when number is either 99 or less or 9 or less.

1. GROWTH HABIT:

1 - SPRING 2 - FACULTATIVE WINTER 3 - WINTER Early Growth: 1 - PROSTRATE 2 - SEMIPROSTRATE
3 - ERECT

2. MATURITY (50% Flowering):

1 - EARLY (~~XXXXXXXX~~) 2 - MIDSEASON (~~XXXXXX~~) 3 - LATE (~~XXXXXX~~)

No. of days Earlier than } 1 - ~~XXXXXX~~ 2 - ~~CALIFORNIA MARION~~ 3 - ~~XXXXXXXX~~ 4 - DICKSON

No. of days Later than } 5 - PIROLINE 6 - PRIMUS 7 - UNITAN

3. PLANT HEIGHT (From soil level to top of head):

1 - SEMIDWARF 2 - SHORT (~~XXXXXXXX~~) 3 - MEDIUM TALL (~~XXXXXX~~) 4 - TALL (~~XXXXXX~~)

Cm. Shorter than } 1 - ~~XXXXXX~~ 2 - ~~CALIFORNIA MARION~~ 3 - ~~XXXXXXXX~~ 4 - DICKSON

Cm. Taller than } 5 - PIROLINE 6 - PRIMUS 7 - UNITAN

4. STEM:

Exertion (Flag to spike at maturity): 1 - 0 - 3 cm. 2 - 3 - 10 cm. Anthocyanin: 1 - ABSENT 2 - PRESENT
3 - 10 - 15 cm.

NO. OF NODES (Originating from node above ground)

Collar Shape: 1 - CLOSED 2 - V-SHAPED 3 - OPEN Shape of Neck: 1 - STRAIGHT 2 - SNAKY
4 - MODIFIED CLOSED OR OPEN 3 - OTHER (Specify) .

5. LEAF:

Basal leaf sheath (seedling): 1 - GLABROUS 2 - PUBESCENT Position of flag leaf (at boot stage): 1 - DROOPING
2 - UPRIGHT

Waxiness: 1 - ABSENT (Glossy) 2 - SLIGHTLY WAXY MM. WIDTH (First leaf below flag leaf)

CM. LENGTH (First leaf below flag leaf) Anthocyanin in leaf sheath: 1 - ABSENT 2 - PRESENT

6. HEAD:

Type: 1 - TWO-ROWED 2 - SIX-ROWED Density: 1 - LAX 2 - ERECT (Not dense)
3 - ERECT (Dense)

Shape: 1 - TAPERING 2 - STRAP 3 - CLAVATE Waxiness: 1 - ABSENT (Glossy) 2 - SLIGHTLY WAXY
4 - OTHER (Specify) Compact 3 - WAXY

Lateral Kernels Overlap: 1 - NONE 2 - AT TIP Rachis (Hair on edge): 1 - LACKING 2 - FEW 3 - COVERED
3 - 1/4 - 1/2 OF HEAD

7. GLUME:

Length: 1 - 1/3 OF LEMMA 2 - 1/2 OF LEMMA Hairs: 1 - NONE 2 - SHORT 3 - LONG
3 - MORE THAN 1/2 OF LEMMA

Hair covering: 1 - NONE 2 - RESTRICTED TO MIDDLE 3 - CONFINED TO BAND 4 - COMPLETELY COVERED

Awns: 1 - LESS THAN EQUAL TO LENGTH OF GLUMES 2 - EQUAL TO LENGTH OF GLUMES
3 - MORE THAN EQUAL TO LENGTH OF GLUMES

Awn Surface: 1 - SMOOTH 2 - SEMISMOOTH 3 - ROUGH

8. LEMMA:

☐ 5 Awn: 1 - AWNLESS 2 - AWNLETS ON CENTRAL ROWS, AWNLESS ON LATERAL ROWS
 3 - SHORT ON CENTRAL ROWS, AWNLETS ON LATERAL ROWS 4 - SHORT (less than equal to length of spike)
 5 - LONG (longer than spike) 6 - HOODED

☐ 4 Awn Surface: 1 - AWNLESS 2 - SMOOTH 3 - SEMISMOOTH 4 - ROUGH

☐ 2 Teeth: 1 - ABSENT 2 - FEW 3 - NUMEROUS ☐ 1 Hair: 1 - ABSENT 2 - PRESENT

☐ 1 Shape of base: 1 - DEPRESSION 2 - SLIGHT CREASE 3 - TRANSVERSE CREASE ☐ 2 Rachilla Hairs: 1 - SHORT 2 - LONG

9. STIGMA:

☐ 1 Hairs: 1 - FEW 2 - MANY

10. SEED:

☐ 2 Type: 1 - NAKED 2 - COVERED ☐ 1 Hairs on Ventral Furrow: 1 - ABSENT 2 - PRESENT

☐ 3 Length: 1 - SHORT (8.0 mm.) 2 - SHORT TO MIDLONG (7.5 - 9.0 mm.) 3 - MIDLONG (8.5 - 9.5 mm.)
 4 - MIDLONG TO LONG (9.0 - 10.5 mm.) 5 - LONG (10.0 mm.)

☐ 2 Wrinkling of hull: 1 - NAKED 2 - SLIGHTLY WRINKLED 3 - SEMIWRINKLED 4 - WRINKLED

☐ 1 Aleurone Color: 1 - COLORLESS (White or Yellow) 2 - BLUE

☐ ☐ PERCENT ABORTIVE ☐ 3 ☐ 2 GMS. PER 1000 SEEDS

11. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

<input type="checkbox"/> 0 SEPTORIA	<input type="checkbox"/> 1 NET BLOTCH	<input type="checkbox"/> 1 SPOT BLOTCH	<input type="checkbox"/> 1 POWDERY MILDEW
<input type="checkbox"/> 1 LOOSE SMUT	<input type="checkbox"/> 0 BACTERIAL BLIGHT	<input type="checkbox"/> 0 COVERED SMUT	<input type="checkbox"/> 0 FALSE LOOSE SMUT
<input type="checkbox"/> 0 STEM RUST	<input type="checkbox"/> 2 LEAF RUST	<input type="checkbox"/> 0 SCAB	<input type="checkbox"/> 2 SCALD
<input type="checkbox"/> 0 AY	<input type="checkbox"/> 0 BSMV	<input type="checkbox"/> 1 BYDV	<input type="checkbox"/> 0 OTHER (Specify)

12. INSECT: (0 = Not tested, 1 = Susceptible, 2 = Resistant)

<input type="checkbox"/> 0 GREEN BUG	<input type="checkbox"/> 0 ENGLISH GRAIN APHID	<input type="checkbox"/> 0 CHINCH BUG	<input type="checkbox"/> 0 ARMYWORM
<input type="checkbox"/> 0 GRASS HOPPERS	<input type="checkbox"/> 0 CERIAL LEAF BETTLE	<input type="checkbox"/> 0 OTHER (Specify)	
HESSIAN FLY RACES { <input type="checkbox"/> 0 GP <input type="checkbox"/> 0 A <input type="checkbox"/> 0 B <input type="checkbox"/> 0 C <input type="checkbox"/> 0 D <input type="checkbox"/> 0 E <input type="checkbox"/> 0 F <input type="checkbox"/> 0 G			

13. CHEMICAL (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

☐ 0 DDT ☐ 0 OTHER (Specify)

14. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	Pennco	Seed size	Barsov
Leaf size	Pennco	Coleoptile elongation	
Leaf color		Seedling pigmentation	
Leaf carriage	Pennco		

REFERENCES: The following publications may be used as a reference aid for the standardization of character descriptions and terms used in this form:

- Wiebe, G. A., and D. A. Reid, 1961, Classification of Barley Varieties Grown in the United States and Canada in 1958, Technical Bulletin No. 1224, U.S. Dept. of Agriculture.
- Reid, D. A., and G. A. Wiebe, 1968, Barley: Origin, Botany, Culture, Winter Hardiness, Genetics, Utilization, Pests, Agriculture Handbook No. 338, U.S. Dept. of Agriculture. pp. 61 - 84.
- Malting Barley Improvement Association, Milwaukee, Wisconsin, 1971, Barley Variety Dictionary.

COLOR: Nickerson's or any recognized color fan may be used to determine color of the described variety.

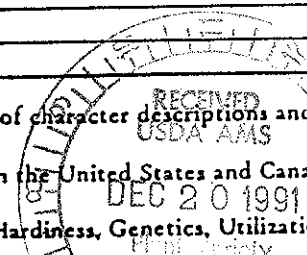


EXHIBIT-E, Statement of Basis of Applicant's Ownership

Pennbar 66 winter barley was developed at The Pennsylvania State University by Dr. Marvin L. Risius. By agreement, the Pennsylvania Agricultural Experiment Station seeks Plant Variety Protection for the variety, Pennbar 66.